

IN THE DRAWINGS:

Please amend Figure 17 by replacing the existing drawing sheet containing existing Figure 17 with the replacement drawing sheet ("Replacement Sheet") containing amended Figure 17 as indicated attached Appendix A.

REMARKS

The Office Action dated March 3, 2009, has been received and carefully considered. In this response, the specification, claims 1-5, 8-23, 26-28, 30, 31, 35, 40, 42, 56-58, 69-78, 81-83, 85, 113, 126-128, 130, 155, 168, 181-183, 185, 225-229, 232-238, 241-266, 268, 269, 271-284, 287-326, 328-336, 449, and 450, and Figure 17 have been amended, and claims 337-448, 451, and 452 have been cancelled without prejudice. No new matter has been added. Entry of the amendments to the specification, claims 1-5, 8-23, 26-28, 30, 31, 35, 40, 42, 56-58, 69-78, 81-83, 85, 113, 127, 128, 130, 155, 168, 182, 183, 185, 225-229, 232-238, 241-266, 268, 269, 271-284, 287-326, 328-336, 449, and 450, and Figure 17, and the cancellation of claims 337-448, 451, and 452 without prejudice is respectfully requested. Reconsideration of the current objections/rejections in the present application is also respectfully requested based on the following remarks.¹

¹ As Applicants' remarks with respect to the Examiner's rejections are sufficient to overcome these rejections, Applicants' silence as to assertions made by the Examiner in the Office Action or certain requirements that may be applicable to such rejections (e.g., assertions regarding dependent claims, whether a reference constitutes prior art, whether references are legally combinable for obviousness purposes) is not a concession by Applicants that such assertions are accurate or such requirements have been met, and Applicants reserve the right to analyze and dispute such in the future.

I. THE INFORMATION DISCLOSURE STATEMENT

On pages 2-3 of the Office Action, the Examiner asserts that the Information Disclosure Statement and accompanying PTO-1449 form that were filed on December 6, 2006, do not comply with 37 CFR § 1.98(b). The Examiner asserts that three references (citation numbers 28, 56, and 60) do not have the proper publication date. The Examiner appears to have considered the three references by initialing same in the PTO-1449 form. Thus, it appears that the Examiner is requesting that Applicants provide the full publication dates for the three references. Applicants hereby provide this information as follows:

- 28.) T. Q. Nguyen, "A tutorial on filter banks and wavelets," University of Wisconsin, Madison, WI53706, USA, published in *Proc. IEEE International Conference on Digital Signal Processing*, Cypress, June 1995.
- 56.) "Digital compression and coding of continuous-tone still images," Int. Org. Standardization ISO/IEC, JTC1 Committee Draft, JPEG 8-R8, August 1990.
- 60.) N. D. Memon et al., "Lossless image compression: A comparative study," *Proc. SPIE*, Vol. 2418, pp. 8-20, March 1995.

In view of the foregoing, Applicants respectfully request that the Examiner confirm that these three references have been considered and withdraw the aforementioned objection to the drawings.

II. THE OBJECTION TO THE DRAWINGS

On pages 3-4 of the Office Action, the drawings were objected to under 37 CFR § 1.84(p)(5). The Examiner asserts that Figure 17 does not include the proper reference numbers.

Applicants have amended Figure 17 to address the Examiner's concerns. A replacement drawing sheet ("Replacement Sheet") containing amended Figure 17 is attached hereto as Appendix A.

In view of the foregoing, Applicants respectfully request that the aforementioned objection to the drawings be withdrawn.

III. THE OBJECTION TO THE SPECIFICATION

On page 4 of the Office Action, the specification was objected to for various informalities.

The Examiner asserts that, at page 22, lines 19-20, both the odd number of delay elements and the even number of delay elements contain 500 and $500+m-2$.

Applicants respectfully submit that the recitations at page 22, lines 18-20, are correct. Specifically, the sentence starting on page 22, line 18, lists all elements (for example, odd number of elements: 500, 501, 502, 503,...), i.e. both even indexed elements (for example: 500, 502,...) and odd indexed elements (for example: 501, 503,...). That is, the sentence starting on page 22, line 18, lists odd number of all elements:

"The following description of the general NSFC operation will be described for case of filters with odd number of delay elements z^{-m} 500, 501, ..., 500+m-2, i.e. even $m=2 \cdot k$." The sentence starting on page 22, line 19, lists only even indexed elements: "The outputs of even indexed delay elements z^{-m} 500, 502, ..., 500+m-4, 500+m-2 are routed ..." There is a difference between odd number and even indexed.

In view of the foregoing, Applicants respectfully request that the aforementioned objection to the specification be withdrawn.

IV. THE INDEFINITENESS REJECTION OF CLAIMS 1-448

On pages 4-5 of the Office Action, claims 1-448 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the invention. This rejection is hereby respectfully traversed with amendment.

The Examiner asserts that the term "the specified contexts" in claim 1 is indefinite. Applicants respectfully disagree. However, in order to forward the present application toward allowance, Applicants have amended claim 1 to address the Examiner's concerns. Also, the Examiner is incorrect in interpreting the term "specified contexts" as "transformed

coefficients." Instead, the term "specified contexts" should be interpreted as defined in the specification. Support for the term "specified contexts" may be found throughout the specification, and particularly in Figures 32 and 33, in Table 14 on page 35, and at page 11, line 28; page 11, line 32; page 12, line 1; page 18, line 12; page 19, line 17; page 20, line 11; page 20, line 28; page 31, line 5; and page 32, line 4.

The Examiner asserts that the term "the machine" in claim 225 is indefinite. Applicants respectfully disagree. However, in order to forward the present application toward allowance, Applicants have amended claim 225 to address the Examiner's concerns.

The Examiner asserts that the term "direct transfer function" in claims 293 and 405 is indefinite. Applicants respectfully disagree. However, in order to forward the present application toward allowance, Applicants have amended claim 293 (claim 405 has been cancelled without prejudice) to address the Examiner's concerns.

In view of the foregoing, Applicants respectfully request that the aforementioned indefiniteness rejection of claims 1-448 be withdrawn.

V. THE WRITTEN DESCRIPTION REJECTION OF CLAIMS 1-112, 225-337,
AND 449-452

On pages 5-6 of the Office Action, claims 1-112, 225-336, and 449-452 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is hereby respectfully traversed.

As stated in MPEP § 2163.02, the fundamental factual inquiry is whether a claim defines an invention that is clearly conveyed to those skilled in the art at the time the application was filed. The subject matter of the claim need not be described literally (i.e., using the same terms or in *haec verba*) in order for the disclosure to satisfy the description requirement.

The Examiner asserts that the term "machine readable code" in claims 225, 280, and 449-452 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors had possession of the claimed invention. Applicants respectfully disagree. However, in order to forward the present application toward allowance, Applicants have amended claims 225, 280, and 449-450 (claims 451 and 452 have been cancelled without prejudice) to address the Examiner's concerns.

The Examiner asserts that claims 1 and 56 contain subject matter which was not described in the specification in such a

way as to reasonably convey to one skilled in the art that the inventors had possession of the claimed invention. Applicants respectfully disagree. However, in order to forward the present application toward allowance, Applicants have amended claims 1 and 56 to address the Examiner's concerns. Also, specification support for subband transformer, probability estimator, and entropy encoder structure is provided between page 18, line 4, and page 46, line 9.

In view of the foregoing, Applicants respectfully request that the aforementioned written description rejection of claims 1-112, 225-336, and 449-452 be withdrawn.

VI. THE NON-STATUTORY SUBJECT MATTER REJECTION OF CLAIMS 1-452

On pages 7-12 of the Office Action, claims 1-452 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. This rejection is hereby respectfully traversed.

"A claimed process is patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." In re Bilski, 545 F.3d 943, 954 (Fed. Cir. 2008). That is, "a claimed process involving a fundamental principle that uses a particular machine or apparatus would not pre-empt uses of the principle that do not also use the specified machine or

apparatus in the manner claimed." Id. Also, "a claimed process that transforms a particular article to a specified different state or thing by applying a fundamental principle would not pre-empt the use of the principle to transform any other article, to transform the same article but in a manner not covered by the claim, or to do anything other than transform the specified article." Id. Thus, "a claim that is tied to a particular machine or brings about a particular transformation of a particular article does not pre-empt all uses of a fundamental principle in any field but rather is limited to a particular use, a specific application." Id. at 957. However, even if a claim recites a specific machine or a particular transformation of a specific article, the recited machine or transformation must not constitute mere "insignificant postsolution activity." Id.

The Examiner asserts that claims 1-452 are directed to non-statutory subject matter. Applicants respectfully disagree. However, in order to forward the present application toward allowance, Applicants have amended independent claims 1, 56, 113, 168, 225, and 280 to more clearly recite a process that: (1) is tied to a particular machine or apparatus, or (2) transforms a particular article into a different state or thing. For example, Applicants respectfully submit that amended claim 1 clearly recites an apparatus comprising at least one single-

level direct subband transformer, at least one encoding probability estimator, at least one entropy encoder, and an output compressed buffer, which are clearly all tied to a particular machine or apparatus, and which also transform a particular article (e.g., input data) into a different state or thing (e.g., transformation coefficients). Also, as discussed above, claims 337-448, 451, and 452 have been cancelled without prejudice. Furthermore, Applicants directs the Examiner to the case law set forth in In re Beauregard, 53 F.3d 1583, (Fed. Cir. 1995), Ex parte Lundgren, 76 USPQ2d 1385 (Bd. Pat. App. & Int. 2005), and others, which clearly provide a patentable subject matter basis for claims 225 and 280.

In view of the foregoing, Applicants respectfully request that the aforementioned non-statutory subject matter rejection of claims 1-452 be withdrawn.

VII. THE OBVIOUSNESS REJECTION OF CLAIMS 1-13, 31-34, 56-68, 86-89, 113-125, 143-146, 168-180, 198-201, 225-237, 255-258, 280-292, 310-313, 337-349, 367-370, 392-404, 422-425, AND 449-452

On pages 13-25 of the Office Action, claims 1-13, 31-34, 56-68, 86-89, 113-125, 143-146, 168-180, 198-201, 225-237, 255-258, 280-292, 310-313, 337-349, 367-370, 392-404, 422-425, and 449-452 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,141,446 to Boliek et al.

("Boliek") in view of U.S. Patent No. 5,926,791 to Ogata et al. ("Ogata"). This rejection is hereby respectfully traversed.

Under 35 U.S.C. § 103, the Patent Office bears the burden of establishing a prima facie case of obviousness. In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988). There are four separate factual inquiries to consider in making an obviousness determination: (1) the scope and content of the prior art; (2) the level of ordinary skill in the field of the invention; (3) the differences between the claimed invention and the prior art; and (4) the existence of any objective evidence, or "secondary considerations," of non-obviousness. Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966); see also KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727 (2007). An "expansive and flexible approach" should be applied when determining obviousness based on a combination of prior art references. KSR, 127 S. Ct. at 1739. However, a claimed invention combining multiple known elements is not rendered obvious simply because each element was known independently in the prior art. Id. at 1741. Rather, there must still be some "reason that would have prompted" a person of ordinary skill in the art to combine the elements in the specific way that he or she did. Id.; In re Icon Health & Fitness, Inc., 496 F.3d 1374, 1380 (Fed. Cir. 2007). Also, modification of a prior art reference may be obvious only if

there exists a reason that would have prompted a person of ordinary skill to make the change. KSR, 127 S. Ct. at 1740-41.

Regarding claims 1 and 56, the Examiner asserts that the claimed invention would have been obvious in view of Boliek and Ogata. Applicants respectfully disagree. In particular, Applicants note that there are many disadvantages of Boliek in comparison with the claimed invention, such as: 1.) huge memory requirements, due to parent-child context dependent relationship (e.g., see Figure 1 of Boliek); 2.) processing slowdown, due to the utilization of "bit-planes" as importance level planes of transform coefficients and context model conditions wavelet coefficients in bit-significance representations (e.g., see column 10, lines 19-23); 3.) less efficient binary entropy coders or even worse, Huffman encoder (e.g., see column 10, lines 31-33); 4.) increased latency, due to entropy encoding after a histogram is generated, since "based on the histogram, the style is chosen" (e.g., see column 12, lines 2-3); and 5.) there is no mention of a data buffer to synchronize data, because every processing step (multi-component handling, style select, reversible wavelet transform, embedded order quantization, context modeling and entropy coding) requires huge memory buffers and associated pointers, according to related U.S. Patent Nos. 5,966,465 (claims 1, 15, 16, 28, 33, 38 and

39), 5,867,602 (claims 31, 36 and 40) and 5,748,786 (claims 1, 9 and 17), which are the result of a continuation-in-part process.

Meanwhile, Ogata explicitly implements synchronization memory (delay) between a filtering stage and a quantizer stage, which is a well-known design.

Also, the combination of Boliek (codec system) and Ogata (time delay buffer) would not result in the claimed invention. More specifically, claim 1 recites a new lossless encoder by utilizing new elements, such as: a direct subband transformer, an encoding probability estimator, an entropy encoder and an output compressed buffer, connected AFTER the entropy encoder, without any additional synchronization memory buffer between the subband transformer and the encoding probability estimator. Similarly, claim 56 recites a new lossless decoder by utilizing new elements, such as: an inverse subband transformer, a decoding probability estimator, an entropy decoder and an input compressed buffer, connected BEFORE the entropy decoder, without any additional synchronization memory buffer between the decoding probability estimator and the inverse subband transformer.

Furthermore, huge differences between adaptive filters and non-stationary filters according to the claimed invention are apparent even starting from adaptive filter basics, such as a definition of an adaptive filter, provided at:

http://en.wikipedia.org/wiki/Adaptive_filter:

"An adaptive filter is a filter that self-adjusts its transfer function according to an optimizing algorithm. Because of the complexity of the optimizing algorithms, most adaptive filters are digital filters that perform digital signal processing and adapt their performance based on the input signal. By way of contrast, a non-adaptive filter has static filter coefficients (which collectively form the transfer function)".

A transfer function of a non-stationary filter according to the claimed invention is not self-adjusted by any optimizing algorithm, nor there is any optimizing algorithm. Also, the input signal does not have any influence to a transfer function, which preferably results from a predetermined time-varying (non-stationary) structure of a non-adaptable filter with static filter coefficients, described in detail in the specification of the referenced patent application between page 18, line 4, and page 26, line 18.

There are many University books with more details about design of digital and analogue filters and the description of dominant poles, which have nothing in common with binary decisions with more than 50% probability. For example, Richard

G. Lyons, "Understanding Digital Signal Processing", Prentice Hall, Upper Saddle River, NJ 07458, 2001 (page 230). In a nutshell, for a first-order low-pass filter, the cut-off frequency is defined by the frequency of a dominant pole, so the output signal magnitude at the cut-off frequency drops 3dB in comparison with the output signal magnitude in the passband down to DC signal, while the output signal magnitude drops approximately 20dB / decade for frequencies above the cut-off frequency.

In view of the foregoing, Applicants respectfully submit that claims 1 and 56 should be allowable over Boliek and Ogata.

Regarding claims 2-13, 31-34, 57-68, and 86-89, these claims are dependent upon independent claims 1 and 56. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). Thus, since independent claims 1 and 56 should be allowable as discussed above, claims 2-13, 31-34, 57-68, and 86-89 should also be allowable at least by virtue of their dependency on independent claims 1 and 56. Moreover, these claims recite additional features which are not disclosed, or even suggested, by the cited references taken either alone or in combination.

Regarding claims 113, 168, 225, and 280, while different in overall scope, these claims recite subject matter related to

claims 1 and 56. Thus, the arguments set forth above with respect to claims 1 and 56 are equally applicable to claims 113, 168, 225, and 280. Accordingly, Applicants respectfully submit that claims 113, 168, 225, and 280 should be allowable over Boliek and Ogata for the same reasons as set forth above with respect to claims 1 and 56.

Regarding claims 114-125, 143-146, 169-180, 198-201, 226-237, 255-258, 281-292, and 310-313, these claims are dependent upon independent claims 113, 168, 225, and 280. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). Thus, since independent claims 113, 168, 225, and 280 should be allowable as discussed above, claims 114-125, 143-146, 169-180, 198-201, 226-237, 255-258, 281-292, and 310-313 should also be allowable at least by virtue of their dependency on independent claims 113, 168, 225, and 280. Moreover, these claims recite additional features which are not disclosed, or even suggested, by the cited references taken either alone or in combination.

As discussed above, claims 337-349, 367-370, 392-404, 422-425, and 449-452 have been cancelled without prejudice.

In view of the foregoing, Applicants respectfully request that the aforementioned obviousness rejection of claims 1-13, 31-34, 56-68, 86-89, 113-125, 143-146, 168-180, 198-201, 225-

237, 255-258, 280-292, 310-313, 337-349, 367-370, 392-404, 422-425, and 449-452 be withdrawn.

VIII. THE OBVIOUSNESS REJECTION OF CLAIMS 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, 320, 376, 377, 431, AND 432

On pages 26-28 of the Office Action, claims 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, 320, 376, 377, 431, and 432 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,141,446 to Boliek et al. ("Boliek") in view of U.S. Patent No. 5,926,791 to Ogata et al. ("Ogata") in further view of IEEE Transactions on Computers, Vol. 37, No. 8, August 1988, pages 980-990, to Magenheimer et al. ("Magenheimer"). This rejection is hereby respectfully traversed.

Applicants respectfully submit that the aforementioned obviousness rejection of claims 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, and 320 has become moot in view of the deficiencies of the primary references (i.e., Boliek and Ogata) as discussed above with respect to independent claims 1, 56, 113, 168, 225, and 280. That is, claims 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, and 320 are dependent upon independent claims 1, 56, 113, 168, 225, and 280, and thus inherently incorporate all of the limitations of independent claims 1, 56, 113, 168, 225, and 280. Also, the secondary

reference (i.e., Magenheimer) fails to disclose, or even suggest, the deficiencies of the primary references as discussed above with respect to independent claims 1, 56, 113, 168, 225, and 280. Indeed, the Examiner does not even assert such. Thus, the combination of the secondary reference with the primary references also fails to disclose, or even suggest, the deficiencies of the primary references as discussed above with respect to independent claims 1, 56, 113, 168, 225, and 280. Accordingly, claims 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, and 320 should be allowable over the combination of the secondary reference with the primary references at least by virtue of their dependency on independent claims 1, 56, 113, 168, 225, and 280. Moreover, claims 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, and 320 recite additional features which are not disclosed, or even suggested, by the cited references taken either alone or in combination.

As discussed above, claims 376, 377, 431, and 432 have been cancelled without prejudice.

In view of the foregoing, Applicants respectfully request that the aforementioned obviousness rejection of claims 40, 41, 95, 96, 152, 153, 207, 208, 264, 265, 319, 320, 376, 377, 431, and 432 be withdrawn.

IX. CONCLUSION

In view of the foregoing, Applicants respectfully submit that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number, in order to expedite resolution of any issues and to expedite passage of the present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0206, and please credit any excess fees to the same deposit account.

Respectfully submitted,

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